

Thoracoscopic Dorsal Sympathectomy for Upper Limb Buerger's Disease

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ABSTRACT

Background and Objectives: Thromboangiitis obliterans is a common peripheral vascular disease in India. This study was conducted to assess the efficacy of thoracoscopic dorsal sympathectomy as a treatment for Buerger disease of the upper extremities.

Methods: Thirty thoracoscopic dorsal sympathectomies (17 left- and 13 right-sided) were performed in a tertiary medical center in 5 women and 20 men (mean age, 41 years) between July 2010 and February 2013.

Results: The mean operative time was 30 minutes, and the mean hospital stay was 52 hours. There were no complications. All patients had improvement in pain and were relapse-free after a mean follow-up period of 11.63 months.

Discussion: Thoracoscopic dorsal sympathectomy reduces pain significantly by reducing peripheral resistance and promoting collateral development. The increased magnification of the thoracoscopic approach permits better visualization, ensuring complete excision and therefore good results. Thoracoscopic dorsal sympathectomy for Buerger disease of the upper limb is a safe and effective treatment.

Key Words: Thoracoscopy, Dorsal sympathectomy, Buerger disease.

INTRODUCTION

There can be many etiologic factors for peripheral vascular disease, but the pathogenesis always involves an altered mechanism of vascular flow causing varied symptoms such as pain, ulceration, and gangrene in the affected extremity. In India, where smoking of bidi (country-made cigarette containing tobacco) is very prevalent, Buerger disease is a common vascular problem. Buerger disease, or thromboangiitis obliterans, is a non-atherosclerotic segmental occlusive inflammatory disease of small- and medium-sized vessels. The disease is found worldwide; the prevalence among all patients with peripheral arterial disease ranges from 0.5% to 5.6% in western Europe, 16% to 66% in Japan, and 45% to 63% in India.¹ Tobacco exposure is central to the initiation and progression of the disease. Dorsal sympathectomy has been shown to be an effective treatment for Buerger disease of the upper limb.¹ It acts by decreasing peripheral resistance and increasing cutaneous blood flow.

Thoracoscopic dorsal sympathectomy (TDS) has emerged as a minimally invasive technique for performing dorsal sympathectomy. We report our experience of TDS for Buerger disease of the upper limb.

METHODS

This study was conducted in a tertiary teaching hospital in central India between July 2010 and February 2013. Pre-operative evaluation included a detailed history of the severity and duration of symptoms, previous therapy, and tobacco exposure (bidi smoking/tobacco chewing/bidi making). Associated vascular disease and poor results of medical therapy were documented.² Arterial and venous phase color Doppler of all 4 limbs was performed.³ Patients unfit for general anesthesia were excluded from the study.

Postoperative outcomes were assessed in terms of pain relief (with a visual analog scale), healing of skin ulcers, and progression of previously existing gangrene. Patients were monitored for surgical complications such as pneumothorax, hemothorax, hemopneumothorax, atelectasis, Horner syndrome, compensatory sweating, and intercostal neuralgia.^{4,5}

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Technique

Patients were operated on under general anesthesia with a single-lumen endotracheal tube. The patient was placed in the lateral position, with the surgeon standing anterior to the patient. One 10-mm port (for 30° telescope) was inserted in the fifth intercostal space in the midaxillary line, and two 5-mm working ports were inserted in the third intercostal space in the anterior and posterior axillary lines (**Figure 1**). The posterior parietal pleura was incised to expose the dorsal sympathetic chain. The chain between and including the T2 to T4 ganglia was excised with lateral cauterization (up to 4 cm to eliminate the fibers of Kuntz). A drainage tube was placed through the 10-mm port under full positive-pressure ventilation. The drainage tube was removed after 24 to 48 hours, after a satisfactory chest radiograph was obtained.

WP1 – Working port 5mm – 3rd ICS posterior axillary line

WP2 – Working port 5mm – 3rd ICS anterior axillary line

Patients who had additional lower-limb involvement were subjected to computed tomography–guided chemical lumbar sympathectomy before the TDS, during the same hospitalization.

RESULTS

Twenty-five patients underwent TDS: 5 women and 20 men with a mean age of 41 years (range, 30–52 years). All patients had a history of tobacco exposure in the form of bidi smoking, tobacco chewing, or bidi manufacture. Two of the 5 women had bilateral upper-limb disease and presented with pain in both upper limbs with impending or established ulcer and gangrene in multiple fingers. One woman with bilateral disease had TDS performed bilaterally, at an interval of 1 week, whereas the other woman had only unilateral surgery.

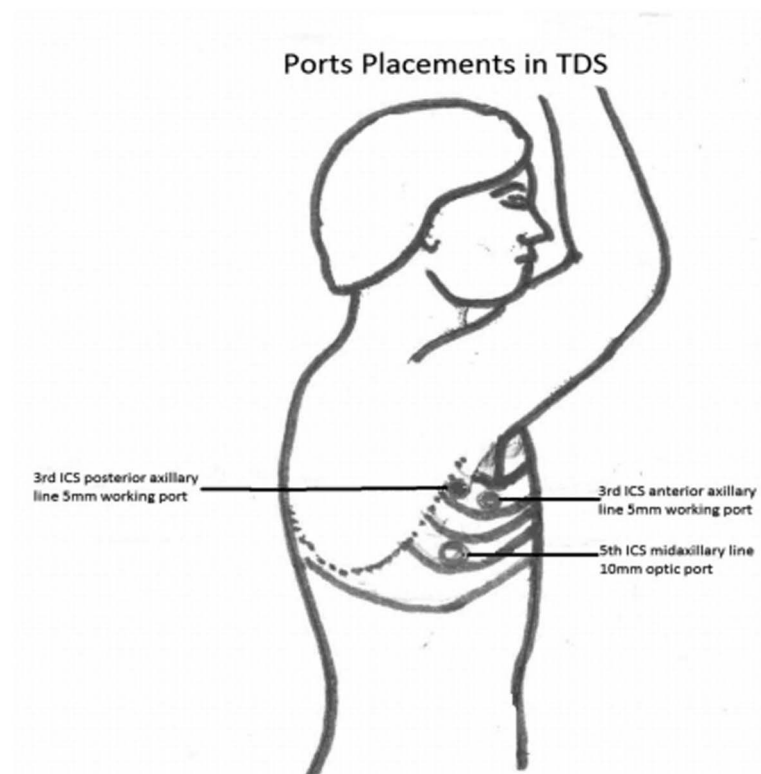


Figure 1. Positions of optical and working ports. ICS = intercostal space.

Of the 20 men, 6 had disease in all 4 extremities. Of these 6 cases, 4 underwent bilateral TDS, with additional pre-operative computed tomography–guided chemical lumbar sympathectomy for bilateral lower-limb disease in 2 patients. The fifth patient already had had amputation of both lower limbs and the right upper limb for the same disease, so a left-sided TDS was performed. For the sixth patient, a unilateral TDS was also performed (**Table 1**).

A total of 30 TDS procedures were performed: 17 left- and 13 right-sided, with debridement and amputation of gangrenous digits whenever required. All the bilateral TDS

procedures were performed with an interval of 1 week between the 2 procedures.

The mean operative time was 30 minutes, and the mean postoperative hospital stay was 52 hours. All the patients were discharged within 72 hours without any complications. All 25 patients had improvement in pain as assessed by the visual analog scale score (**Figure 2**). Local wounds healed well, with none of the patients showing progression of gangrene. They did not require further medical therapy and were relapse-free after a mean follow-up period of 11.63 months (range, 3–24 months).

Table 1.
Results of TDS

	Male	Female	Outcome
No. of patients	20 (80%)	5 (20%)	Total, 25
Age			Range, 30–52 y
Involved extremity			
Unilateral upper limb	14 (56%)	3 (12%)	17 (68%) with TDS
Bilateral upper limb	6 (24%)	2 (8%)	$6 \times 2 + 1 = 13$ (52%) with TDS ^a
Associated lower limb	2 (8%)	None	CTLS ^b
Color Doppler findings in arteries			
Radial	Absent flow, 20 (80%)	Absent flow, 5 (20%)	
Ulnar	Absent flow, 20 (80%)	Absent flow, 5 (20%)	
Brachial	Weak flow, 10 (40%)	Weak flow, 2 (8%)	
Associated ulcer, gangrene			
Only affected limb	20 (80%)	5 (20%)	Ulcers healed; gangrenous part amputated

^aSix male patients underwent bilateral TDS; of 2 female patients presenting with bilateral disease, 1 underwent TDS on one side and 1 did not have any surgery.

^bCTLS = computed tomography scan–guided lumbar sympathectomy.

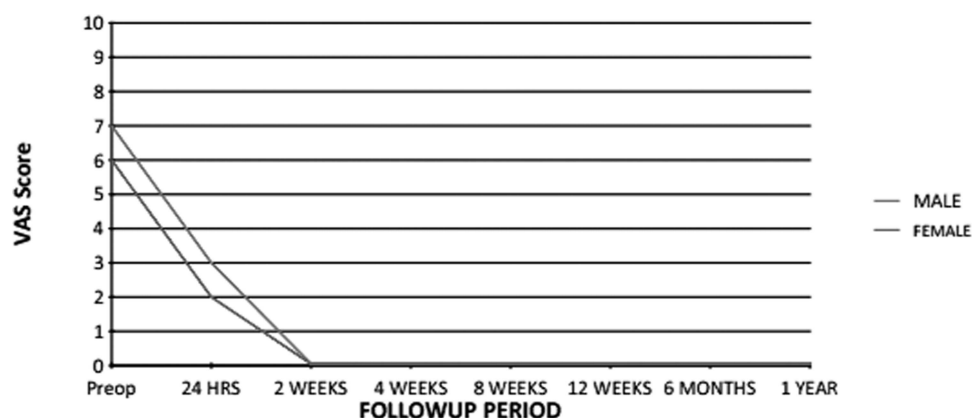


Figure 2. Postoperative analysis of pain by visual analog scale (VAS).

DISCUSSION

Tobacco exposure in any form (tobacco chewing, bidi making, and smoking) is an important etiologic factor for Buerger disease. Although it is more common in young and elderly men and mainly involves the lower limbs,^{1,6} the incidence in women and in the upper limbs is increasing.^{7,8} TDS reduces pain significantly by reducing peripheral resistance and promoting collateral development.^{9,10} TDS has been performed for various indications, most commonly for hyperhidrosis. Other indications include sympathetic disorders such as splanchnic pain associated with pancreatitis (T4–T6), causalgia, reflex sympathetic dystrophy, and post-traumatic pain syndrome.^{4,5,11,12} After TDS, 80% to 90% of patients with peripheral vascular disease have early relief of symptoms, and most of them (78%) remain significantly better even many years after surgery.^{4,5,13–15} Surprisingly, even larger series reporting TDS have not included patients with Buerger disease, perhaps because of its low prevalence in Western countries.¹ Increased magnification with the thoracoscopic approach permits better visualization and identification of collateral branches and preganglionic fibers, thus ensuring complete excision with good results. No special instruments or anesthetic techniques are required. In our study TDS for Buerger disease of the upper limb was safe and effective, and patients were relapse-free after a maximum follow-up period of 2 years.

CONCLUSION

TDS has been revisited and revived for patients with upper-limb Buerger disease. We conclude that TDS is a safe and effective treatment for patients with upper-limb Buerger disease.

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